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10/731,688	12/09/2003	Haifeng Wang	944-005.024	3274

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EXAMINER

BOAKYE, ALEXANDER O

ART UNIT	PAPER NUMBER
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2667

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/731,688

Applicant(s)

WANG ET AL.

Examiner

ALEXANDER BOAKYE

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-5,6-16,20-22 and 25 is/are allowed.
- 6) ☒ Claim(s) 1,17-19,23,24 and 26 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Kaiser et al. (US Patent # 6,188,717).

Regarding claim 1, Kaiser teaches a method for use in a single-carrier (column 5, lines 30-33; binary phase shift keying and quadrature phase shift keying evidenced by Kaiser correspond to the claimed method for use in single carrier) code division multiple access communications wherein a plurality of data streams in symbol-level for carrying a plurality of transmit symbols are combined in a summing process into at least one chip level code stream for transmission (column 5, lines 34-46, see Fig. 4), the method comprising: adding a plurality of prefixes to the data streams in symbol-level for providing a plurality of further data streams indicative of the prefix-added streams (column 6, lines 45-50 ; multi-carrier modulated data symbols are extended by a cyclic prefix on the transmission side and summed up by the adder block 17 of Fig. 4 ; the claimed prefixes correspond to guard intervals as evidenced by Kaiser); and spread filtering the further data streams in a plurality of code channels prior to the summing process (column 6, lines 45-50 ; column 7, lines 13-16).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17, 18, 19, 23, 24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larsson (US Patent # 6,842,487) in view of Kaiser et al. (US Patent # 6,188,717).

Regarding claim 17, Larsson teaches a plurality of fist modules, for adding a plurality of prefixes to the data streams in symbol-level for providing a plurality of further data streams indicative of the prefix-added data streams (column 7, lines 7-11; see Fig.9), a plurality of second modules, responsive to the further streams, for filtering the prefix-added data streams by a plurality of code signals prior to the summing process (column 7, lines 7-21; column 8, lines 44-52., see Fig. 9 and 1230 of Fig. 12). The claimed chip-level code stream is inherent in orthogonal frequency division multiplexing as evidenced by Larson (column 6, lines 39-41). Larsson differs from the claimed invention in that Larsson does not teach single-carrier and spreading. However, Kaiser discloses single-carrier (column 5, lines 30-33; binary phase shift keying and quadrature phase shift keying evidence by Kaiser correspond to the claimed single carrier) and spreading (column 6, lines 45-50; column 7, lines 13-16). One of ordinary skill in the art would have been motivated to incorporate single carrier and spreading

into the communication system in order to reduce symbol offset interference and also to increase data rate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate single carrier and spreading such as the one taught by Kaiser into the communication system of Larsson with the motivation being that it provides capability for the system to reduce symbol offset interference and also to increase data rate, thus enhancing efficiency.

Regarding claim 18, Larson teaches that each of the data streams carries one of the plurality of transmit symbols the transmitter further comprising a plurality of third modules, for dividing each of the data streams into a plurality of data blocks so as to allow the first modules to add the prefixes to the to the data blocks to the summing process (column 7, lines 7-15 ; see Fig. 9).

Regarding claim 19, Larsson teaches a plurality of fourth modules for combining the plurality of prefix-added data blocks into each of the prefix-added data streams to the spread filtering (column 8, lines 3-9; column 8, lines 44-52).

Regarding claims 23 and 24, Larsson teaches a transmitter (Fig. 9) comprising: a plurality of first modules for adding a plurality of prefixes to the data streams in symbol-level for providing a plurality of further data streams indicative of the prefix-added data streams (column 7, lines 7-11 ; see Fig. 9), and a plurality of second modules, responsive to the further data streams, for filtering the prefix-added data streams by a plurality of code signal prior to the summing process (column 7, lines 7-21 ;column 8, lines 44-52., see Fig. 9 and 1230 of Fig. 12)., and a receiver (Fig. 9b) comprising: a third module for removing the prefixes from the chip-level code stream for

providing a prefix-removed code stream in the time domain (column 8, lines 2-9 ; the claimed chip-level code stream is inherent in the orthogonal frequency division multiplexing as evidenced by Larsson), and a fourth module, for converting the prefix-removed code stream into a transformed signal in frequency domain (column 8, lines 8-10). Larsson differs from the claimed invention in that Larsson does not teach single-carrier and spreading. However, Kaiser discloses single-carrier and spreading (column 6, lines 45-50 ; column 7, lines 13-16). One of ordinary skill in the art would have been motivated to incorporate single carrier and spreading into the communication system in order to reduce symbol offset interference and also to increase data rate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate single carrier and spreading such as the one taught by Kaiser into the communication system of Larsson with the motivation being that it provides capability for the system to reduce symbol offset interference and also to increase data rate, thus enhancing efficiency.

Regarding claim 26, the claimed mobile terminal corresponds to Transmitter, Fig. 9a of Larsson.

Allowable Subject Matter

3. Claims 2-5, 6-16, 20-22 and 25 are allowable.

The following is a statement of reasons for the indication of allowable subject matter: As to claims 2-5, the prior art of record does not teach wherein each of the data streams carries one of the plurality of transmit symbols and wherein each of the data

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streams is divided into a plurality of data blocks so as to allow the prefixes to be added to the data blocks for providing a plurality of prefix-added data blocks. As to claims 6-16, the prior art of record does not teach wherein the transmitted chip-level code stream is received for providing a receiving signal indicative of the received chip-level code stream, and method further comprising: removing the prefixes from the received signal for providing a further signal in time domain indicative of a prefix-removed data stream; and converting the further signal into a transformed signal in frequency domain. As to claims 20-22, the prior art of record does not teach a third module for applying a plurality of feed-forward filter coefficients to the transformed signal for channel equalization in frequency domain and providing equalized signal for despreading.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Boakye whose telephone number is (571) 272-3183. The examiner can normally be reached on M-F from 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham, can be reached on (571) 272-3179. The fax number is (571) 273-8300. Any inquiry of general nature or relating to the status of this application or proceeding should be directed to Electronic Business Center numbers 866-217-9197 and 703-305-3028.

Alexander Boakye

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Patent Examiner

AB

01/18/06


CHI PHAM
SUPERVISORY PATENT EXAMINER
1/19/06